

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Amend claims 1, 3, 6, 9, 10, 11, 12, 16, 17, 23, 25, 30, 37, 38, 40-63 as follows.

Listing of Claims:

B 1
1. **(currently amended)** A method for providing firewall fault-tolerance in a network, the network including a plurality of firewalls, at least one server and at least one network flowswitch, the method comprising:

detecting in the network flowswitch an occurrence of a failed firewall of the plurality of firewalls each having a different fixed media access control (MAC) address;

detecting in the network flowswitch a packet from the server directed to the failed firewall after the occurrence of a failed firewall is detected;

changing a ~~media access control (MAC)~~ MAC address of the packet ~~with a~~ to the fixed MAC address of a functional firewall of the plurality of firewalls when the packet is detected; and

relaying the packet to the functional firewall after the MAC address of the packet is changed.

2. **(original)** The method of claim 1 wherein the network comprises a plurality of servers.

3. **(currently amended)** The method of claim 2 wherein relaying the packet to the functional firewall comprises relaying the packet to the functional firewall over a ~~media~~ medium that is not shared with packets directed to other firewalls or servers.

4. **(original)** The method of claim 1 wherein said detecting an occurrence of a failed firewall comprises sending a request to the plurality of firewalls, wherein an absence of a response from a particular firewall of the plurality of firewalls is indicative of a failure of the particular firewall.

5. **(original)** The method of claim 1 wherein said detecting an occurrence of a failed firewall comprises sending at least one Address Resolution Protocol (ARP) request to each firewall of the plurality of firewalls, wherein an absence of a reply to an ARP request from a particular firewall of the plurality of firewalls is indicative of a failure of the particular firewall.

6. **(currently amended)** The method of claim 1 further comprising:

detecting an address resolution protocol (ARP) request from the server to the failed firewall; and

responding to the ARP request with the fixed MAC address of the functional firewall, whereby the server is configured to send subsequent outbound packets with the fixed MAC address of the functional firewall.

7. **(original)** The method of claim 1 wherein said detecting an occurrence of a failed firewall comprises sending ICMP echo packets to each firewall of the plurality of firewalls and wherein an absence of a response from a particular firewall of the plurality of firewalls during a predetermined interval is indicative of a failure of the particular firewall.

8. **(original)** The method of claim 1 further comprising:

detecting a recovery of the failed firewall, the failed firewall becoming a recovered firewall; and
terminating said detecting a packet from the server directed to the failed firewall when said failed firewall recovers.

9. **(currently amended)** The method of claim 8 further comprising waiting for a time-out period to expire after said detecting when the failed firewall recovers.

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10. **(currently amended)** The method of claim 9 wherein the time-out period is greater than or equal to a time period needed for the recovered firewall to learn routes to all known clients.

11. **(currently amended)** The method of claim 8 wherein said detecting a recovery of the failed firewall comprises sending to the failed firewall a request, and a response from the failed firewall is indicative of a recovery of the failed firewall.

12. **(currently amended)** The method of claim 8 wherein said detecting a recovery of the failed firewall comprises detecting a packet from the failed firewall in response to a request.

13. **(original)** The method of claim 8 wherein said detecting a recovery of the failed firewall comprising sending ARP requests to each firewall of the plurality of firewalls, wherein an occurrence of a reply to an ARP request from the failed firewall is indicative of a recovery of the failed firewall.

14. **(original)** The method of claim 1 wherein packets are transferred between the server and a firewall of the plurality of firewalls through a switch circuit.

15. **(original)** The method of claim 14 wherein the switch circuit comprises a switched Ethernet circuit.

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16. **(currently amended)** An apparatus for providing firewall fault-tolerance in a network, the network including a plurality of firewalls, at least one server and at least one network flowswitch, the apparatus comprising:

means for detecting an occurrence of a failed firewall in the plurality of firewalls each having a difference fixed media access control (MAC) address;

means for detecting a packet from the server directed to the failed firewall after the failed firewall is detected;

means for changing a ~~media access control (MAC)~~ MAC address of the packet ~~with a~~ to the fixed MAC address of a functional firewall of the plurality of firewalls when the packet is detected; and

means for relaying the packet to the functional firewall after the MAC address of the packet is changed.

17. **(currently amended)** The apparatus of claim 16 further comprising:

means for detecting an address resolution protocol (ARP) request from the server to the failed firewall; and

means for responding to the ARP request with the fixed MAC address of the functional firewall, wherein the server sends subsequent outbound packets with the fixed MAC address of the functional firewall.

18. **(original)** The apparatus of claim 16 wherein said means for detecting a failed firewall comprises means for transmitting a request to the plurality of firewalls, wherein an absence of a reply from a particular firewall of the plurality of firewalls is indicative of a failure of the particular firewall.

19. **(original)** The apparatus of claim 16 wherein said means for detecting a failed firewall comprises means for sending ARP requests to each firewall of the plurality of firewalls, wherein an absence of a reply to an ARP request from a particular firewall of the plurality of firewalls is indicative of a failure of the particular firewall.

20. **(original)** The apparatus of claim 16 further comprising:
means for detecting a recovery of the failed firewall, the failed firewall becoming a recovered firewall; and
means for disabling said means for detecting a packet from the server directed to the failed firewall when said failed firewall recovers.

21. **(original)** The apparatus of claim 20 wherein said means for detecting a recovery of the failed firewall comprises means for transmitting a request to the plurality of firewalls, wherein a response from the failed firewall is indicative of recovery of the failed firewall.

22. **(original)** The apparatus of claim 16 wherein said means for detecting a recovery of the failed firewall comprises means for sending ARP requests to each firewall of the plurality of firewalls, wherein an occurrence of a replay to an ARP request from the failed firewall is indicative of a recovery of the failed firewall.

23. **(currently amended)** A network having firewall fault-tolerance, the network configured to be coupled to a network backbone, the network comprising:

a switch circuit;

a first firewall coupled to said switch circuit and the network backbone, said first firewall having a fixed media access control (MAC) address;

a second firewall coupled to said switch circuit and the network backbone, said second firewall having a fixed MAC address different from the fixed MAC address of the first firewall; and

a server coupled to the switch circuit,

wherein the switch circuit is configured to detect when the first firewall fails, the switch circuit being further configured to monitor packets sent by the server to the first firewall and to change in the packet the fixed MAC address of the first firewall to the fixed MAC address of the second firewall.

24. **(original)** The network of claim 23 further comprising a plurality of servers, the plurality of servers including the server.

25. **(currently amended)** The network of claim 23 wherein the switch circuit is further configured to relay the packet to the second firewall after changing the fixed MAC address of the first firewall to the fixed MAC address of the second firewall.

26. **(original)** The network of claim 23 wherein the switch circuit is configured to detect a failed firewall by transmitting a request to the first and second firewalls, wherein an absence of a reply from a particular firewall of the first and second firewalls is indicative of a failure of the particular firewall.

27. **(original)** The network of claim 23 wherein the switch circuit is configured to detect a failed firewall by sending ARP requests to the first and second firewalls, wherein an absence of a replay to an ARP request from a particular firewall of the first and second of firewalls is indicative of a failure of the particular firewall.

28. **(original)** The network of claim 23 wherein the switch circuit is configured to detect a failed firewall by sending ICMP echo requests to the first and second firewalls, wherein an absence of a reply to an ICMP echo request from a particular firewall of the first and second of firewalls is indicative of a failure of the particular firewall.

29. **(original)** The network of claim 23 wherein the switch circuit is configured to detect a failed firewall by monitoring responses from the firewalls to requests sent at predetermined intervals.

30. **(currently amended)** The network of claim 23 wherein the switch circuit is further configured to:

detect an address resolution protocol (ARP) request from the server to the first firewall; and

respond to the ARP request with the fixed MAC address of the second firewall, whereby the server sends subsequent outbound packets with the fixed MAC address of the second firewall.

31. **(original)** The network of claim 23 wherein the switch circuit is further configured to:

detect when the first firewall recovers; and

terminate monitoring for packets sent by the server to the first firewall after the first firewall recovers.

32. **(original)** The network of claim 31 wherein the switch circuit is further configured to wait for a time-out period to expire after detecting when the first firewall recovers.

33. **(original)** The network of claim 32 wherein the time-out period is greater than or equal to a time period needed for the recovered first firewall to learn routes to all known clients.

34. **(original)** The network of claim 31 wherein the switch circuit is configured to detect a recovery of the failed firewall by transmitting a request to the first and second firewalls, wherein receipt of a response from the failed firewall is indicative of a recovery of the failed firewall.

35. **(original)** The network of claim 31 wherein the switch circuit is configured to detect a recovery of the failed firewall by sending ARP requests to the first and second firewalls, wherein an occurrence of a reply to an ARP request from the failed firewall is indicative of a recovery of the failed firewall.

36. **(original)** The network of claim 31 wherein the switch circuit is configured to detect a recovery of the failed firewall by sending ICMP echo requests to the first and second firewalls, wherein an occurrence of a reply to an ICMP echo request from the failed firewall is indicative of a recovery of the failed firewall.

37. **(currently amended)** The network of claim 23 wherein packets are transferred between the server and the first firewall through

the switch circuit, and between the server and the second firewall through the switch circuit.

38. **(currently amended)** The network of claim 36 wherein the switch circuit is configured to provide full-duplex communication between the first firewall and the server.

39. **(original)** The network of claim 36 wherein the switch circuit comprises a switched Ethernet circuit.

40. **(currently amended)** A method for providing fault-tolerance in a network, the network including a plurality of firewalls each having a different fixed media access control (MAC) address, the method comprising:

generating a request message on a first side of a first firewall in the plurality of firewalls;

sending the request message through the first firewall to a second side of the first firewall; and

processing an absence of a reply from the second side to the request message as a failure of the first firewall, including

replacing, in a packet, the fixed MAC address of the first firewall with the fixed MAC address of a second firewall of the plurality of firewalls.

41. **(currently amended)** The method of ~~Claim~~claim 40 further comprising:

maintaining in a first memory on said first side a first functional status for each firewall;

maintaining in a second memory on said second side a second functional status for each firewall; and

wherein said first functional status is identical to said second functional status.

42. **(currently amended)** The method of ~~Claim~~claim 41 further comprising:

maintaining session information in a firewall for each session between computers separated by the firewall.

43. **(currently amended)** The method of ~~Claim~~claim 40 further comprising:

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sending a reply on said port.

47. **(currently amended)** A network having fault-tolerance, the network comprising:

a first switch circuit;

a second switch circuit; and

a plurality of firewalls each having a different fixed media access control (MAC) address, the plurality of firewalls being coupled to each of the first switch circuit and the second switch circuit, each firewall being coupled to the first switch circuit by a first medium that is not shared with another firewall in the plurality of firewalls and each firewall is being coupled to the second switch circuit by a second medium that is not shared with another firewall in the plurality of firewalls; wherein

a switch circuit of the first and the second switch circuits responds to a first firewall of the plurality of firewalls being functional by sending a first packet that has the fixed MAC address of the first firewall and is received by said switch circuit to the first firewall, and responds to a failure of the first firewall by replacing in a second packet received by said switch circuit the fixed MAC address of the first firewall with the fixed MAC address of a functional second firewall of the plurality of firewalls and sending the second packet with the replaced MAC address to the second firewall.

48. **(currently amended)** The network of Claim-claim 47 further comprising:

a plurality of first computers, each first computer being coupled to the first switch circuit, each first computer being configured with a the media access control (MAC) address of ~~a predetermined~~ the first firewall ~~in the plurality of firewalls~~, the first predetermined firewall being a default gateway for transferring packets outside the network.

48-49. (currently amended) The network of ~~Claim~~-claim 48 47, wherein the computers are hereinafter "first computers", the network further comprising:

a plurality of second computers, each second computer being coupled to the first second switch circuit, each second computer being configured with a the MAC address of a ~~predetermined~~ the first firewall in the plurality of firewalls, the predetermined first firewall being a default gateway for transferring packets ~~outside~~ inside the network.

49-50. (currently amended) The network of ~~Claim~~-claim 47 further comprising:

a plurality of routers coupled to the second switch circuit.

50-51. (currently amended) The network of ~~Claim~~-claim 47 wherein each of the first switch circuit and the second switch circuit comprises:

a first storage element encoded with a list of the plurality of firewalls; and

a second storage element encoded with an identify of a firewall in the plurality as a replacement firewall for any other firewall in the plurality that has failed.

51-52. (currently amended) The network of claim 47 wherein:

each of the first switch circuit and the second switch circuit is configured to send a request message to the other of the first switch circuit and the second switch circuit; and

each of the first switch circuit and the second switch circuit is configured to treat absence of a response to the request message as a failure of a firewall through which the request message was sent.

52.53. (currently amended) The network of ~~Claim~~-claim 52 wherein:

the request message conforms to an internet protocol selected from the group consisting of:

- (a) ping;
- (b) address resolution protocol (ARP); and
- (c) internet message control protocol (ICMP).

53.54. (currently amended) The network of ~~Claim~~-claim 47 wherein:

the first switch circuit transfers a plurality of packets to a the first firewall ~~in the plurality of firewalls~~ through a first medium without changing any portion of any packet in the plurality of packets while the first firewall is functional.

54.55. (currently amended) The network of ~~Claim~~-claim 47 wherein:

the first switch circuit replaces in each received packet ~~(hereinafter "modified packet") a media access control (MAC)~~ the fixed MAC address of the first firewall with a the MAC address of a the second firewall ~~in the plurality of firewalls~~ and transfers each modified packet to the second firewall only while the first firewall is nonfunctional.

55.56. (currently amended) The network of ~~Claim~~-claim 47 wherein ~~the~~ each switch circuit comprises a switched Ethernet circuit.

56.57. (currently amended) A method of providing fault-tolerance in a network, the network including a plurality of firewalls each

having a different fixed media access control (MAC) address, the method comprising:

detecting a failure of a first firewall in the plurality of firewalls;

and

replacing, in a packet, ~~a media access control (MAC)~~ the fixed MAC address of the first firewall with a the fixed MAC address of a second firewall in the plurality of firewalls in response to the failure.

57.58. (currently amended) The method of ~~Claim 56~~ claim 57 wherein:

the detecting is performed in a switch circuit.

58.59. (currently amended) The method of ~~Claim 56~~ claim 57 further comprising:

receiving the packet after detecting the failure and prior to the replacing.

59.60. (currently amended) The method of claim 57 ~~56~~ further comprising:

transferring a plurality of packets other than the packet, between a host and a firewall in the plurality of firewalls through a switch circuit.

60.61. (currently amended) The method of ~~Claim 59~~ claim 60 wherein:

each of the packets contains ~~an~~ a first internet protocol(IP address; and

the method does not change the first IP address during transferring of the packets to any of the firewalls.

61.62. (currently amended) The method of Claim 59 claim 61

wherein:

~~the IP address is hereinafter "first IP address";~~

each of the firewalls has a first side and a second side; and

each of the firewalls has the first IP address on the first side and
a second IP address on the second side.

62.63. (currently amended) The method of Claim 59 claim 61

wherein:

the method does not change the MAC address of any of the
packets during the transferring, until the detecting of failure.
